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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/400,346	09/20/1999	KENTARO TOYAMA	MCS-058-99	3337

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EXAMINER
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LE, BRIAN Q

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 11/04/2003

16

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/400,346

Applicant(s)

TOYAMA ET AL.

Examiner

Brian Q Le

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09/22/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20,93 and 94 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20,93-94 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 September 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

Art Unit: 2623

### **Response to Arguments**

1. Applicant's response filed September 22, 2003, has been entered and made of record.
2. Applicant's arguments with respect to claims 1-20, and 93-94 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 9-19, and 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sambonsugi U.S. Patent No. 6,335,985 and further in view of Wakitani U.S. Patent No. 6,031,568.

Regarding claim 1, Sambonsugi teaches a system for maintaining a background model (Fig 2, 12) for an image sequence (Fig 20, 141) having a plurality of pixels (Fig 7 and column 19, 18-21), comprising:

A pixel processing module that processes the image sequence on a pixel scale (column 4, line 20-35);

A prediction module that provides predictions for shape by the detection of pixel values (column 4, lines 20-36 and 48-55) (column 20, lines 52-67); and

At least one refinement module that processes the image sequence on a spatial scale other than the pixel scale (column 4, line 37-47).

Art Unit: 2623

As disclosed by the applicant, spatial scale includes pixel scale, regional scale or frame scale. Sambonsugi clearly teaches pixel scale, regional scale and frame scale through out the reference (column 4, line 37-47 and column 7, line 5-23). Also, it is inherent that a refinement module can be an error minimization technique or enhancement to optimize a new sequence image.

However, Sambonsugi does not clearly teach a prediction module that provides predictions for a value of each of the plurality of pixels. Wakitani teaches object tracking (abstract) in sequence images (column 1, lines 6-10) further comprises a prediction module (FIG. 2, box 62) that provides predictions for a value of each of the plurality of pixels (motion prediction values and motion prediction maps for each of the plurality of the pixels (column 14, lines 25-39). Modifying Sambosugi's method of maintaining a background model for an image sequence having a plurality of pixels according to Wakitani would able to predict the motion values of each pixel and use them for motion mapping to predict the motion of the tracking object in the image sequence. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Sambosugi according to Wakitani.

For claim 2, Sambonsugi also teaches the system wherein the pixel processing module further comprises determining an initial background model and providing an initial pixel assignment of each of the plurality of pixels (column 4, line 19-23).

For claim 3, Sambonsugi teaches the system wherein a first refinement module is a region processing module that processes the image sequence on a regional scale (column 4, line 37-47).

Art Unit: 2623

Referring to claim 4, Sambonsugi discloses the system wherein the region processing module further comprises considering a relationship between at least some of the plurality of pixels to provide pixel assignment (column 13, line 60-67 and column 14, line 10-15).

For claim 5, Sambonsugi also discloses the system wherein a second refinement module is a frame processing module that processes the image sequence on a frame scale (column 12, 25-50 and 62-67).

Referring to claim 6, Sambonsugi teaches the system wherein the frame processing module further determines a background model that most accurately represents an actual background of the image sequence and performs: (b) substituting a more accurate background model in place of the current background model (column 12, line 0-17).

And for claim 7, Sambonsugi also teaches the system further comprising a postprocessing module that provides enhancement of the image sequence (column 18, line 52-60 and column 31, line 54-67).

Referring to claim 9, Sambonsugi teaches a concept of the system wherein the postprocessing module provides enhancement after the pixel processing module and before the frame processing module (column 32, line 23-35). Furthermore, it also is a designer to have a specific sequence of postprocessing to achieve the desired goal. Therefore, it would have been obvious for one in the ordinary skill of the art to come up with a method wherein the postprocessing module provides enhancement after the pixel processing module and before the frame processing module to output a better quality sequence of images.

Art Unit: 2623

For claim 10, as disclosed above, Sambonsugi also teaches the system wherein the postprocessing module provides enhancement after the frame processing module and before the region processing module (column 33, line 0-9 and column 34, line 9-27).

For claims 11, Please refer back to claim 1 for further discussion. Also, Sambonsugi teaches a computer-readable medium (column 35, line 0-3) having computer-executable modules (column 48, line 31-38).

For claims 12-13, please refer back to the discussion of claim 3.

For claims 14-15, please refer back to the discussion of claims 5 and 7.

Regarding claim 16, as discussed in claim 1 with regard to the prediction method, Sambonsugi teaches a method for maintaining a background model (Fig 2, 12) of an image sequence (Fig 20, 141) having a plurality of pixels (Fig 7 and column 19, line 18-21), comprising:

Processing the image sequence on a pixel scale so as to determine a current background model and provide an initial assignment for each of the plurality of pixels (column 6, line 35-48 and column 4, line 19-23); and

Refining the pixel processing by processing on a spatial scale other than the pixel scale (column 7, line 53-64) to further refine at least one of: (b) the initial pixel assignment (column 13, line 60-65 and column 14, line 0-15).

For claims 17-19, please refer back to the discussion of claims 3, 5 and 7.

For claim 93, please refer back to claim 1 for the explanation.

For claim 94, please refer back to claims 1 and 2 respectively for the explanation.

Art Unit: 2623

5. Claims 8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sambonsugi et al. U.S. Patent No. 6,335,985 and Wakitani U.S. Patent No. 6,031,568 as applied to claim 7 above, and further in view of Jain et al. U.S. Patent No. 6,263,091.

Referring to claim 8, as disclosed in claim 7, Sambonsugi teaches the enhancement concept of the image sequence. However, Sambonsugi failed to introduce that the enhancement technique can be speckle removal. Nevertheless, Jain teaches the technique to isolate foreground and background using speckle removal (column 17, line 42-52). Therefore, it would have been obvious to use speckle removal as an enhancement technique because speckle removal is well known in the art to use to remove the presence of noise, dirt, breaks, and smudges in input images.

For claim 20, please refer back to the discussion above.

#### **Reference Cited**

6. The following patents are cited to further show the state of the art with respect to image segmentation, foreground, background, and prediction based on pixel value:

U.S. Patent No. 6,591,146 to Pavlovic et al., teaches method for learning switching linear dynamic system models from data.

U.S. Patent No. 6,008,865 to Fogel, teaches segmentation-based method for motion-compensated frame interpolation.

U.S. Patent No. 5,768,438 to Etoh, teaches image encoding/decoding device.

U.S. Patent No. 6,453,069 to Matsugu, teaches method of extracting image from input image using reference image.

Art Unit: 2623


**Contact Information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q Le whose telephone number is 703-305-5083. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-5397 for regular communications and 703-308-5397 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

BL  
October 29, 2003

  
AMELIA M. AU  
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